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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,920	02/02/2001	James J. Alwan	100.718.419 (MIC- 77US)	8909

7590

05/15/2003

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EXAMINER

MACCHIAROLO, PETER J

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/775,920

Applicant(s)

ALWAN, JAMES J.

Examiner

Peter J Macchiarolo

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☒ Claim(s) 1, 8, 13, 17, 27 and 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The informal drawings submitted on February 2, 2001 are acceptable for examination; however, formal drawings must be submitted upon a condition for allowance.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 14.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 28.
5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. The claims recite many limitations that are not included in the drawings. For example:
 - a. the method including locally applying an etchant as recited in claim 1 must be shown;
 - b. the method including selectively directing an etchant as recited in claim 8 must be shown;
 - c. the method including locally applying an etchant as recited in claim 13 must be shown;

- d. the method including locally applying an etchant as recited in claim 17 must be shown;
 - e. the method including openings as recited in claim 20 must be shown;
 - f. the method including openings as recited in claim 25 must be shown; and
 - g. the selectively spraying a wet etchant and rinsing a residual etchant as recited in claim 27 must be shown or the feature(s) canceled from the claim(s);
6. No new matter should be entered.
7. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objections to the drawings will not be held in abeyance.

Specification

8. The disclosure is objected to because of the following informalities:
9. Page 1 of the specification recites that this Application was "made with Government support under Contract No. ____"
10. Appropriate correction is required.

Claim Objections

11. Claims 1, 8, 27, and 31 are objected to because of the following informalities:
12. In regards to claims 1, 8, and 27, the claim structure used by Applicant does not conform to standard U.S. practice, and is difficult to interpret. Specifically, the claims do not clearly contain a preamble, a transitional word, or a main body. The multiple

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occurrences of the word "comprising" further inhibit proper comprehension of the claim's structure. See MPEP §608.01(m). The Examiner recommends the following claim structure:

[Preamble] [transitional word];

[limitation X];

[limitation Y]; and

[limitation Z].

13. The interpretation of the preambles of Claims 1, 8 and 27 are shown below.
14. Claim 1: "In a method for manufacturing...comprising:"
15. Claim 8: "In a method of making...in the peripheral area comprising:"
16. Claim 27: "In a method for manufacturing...the peripheral region, comprising:"
17. In regards to claim 31, the limitation "said field emission display" has a lack of antecedent basis. The Examiner is interpreting this limitation as "a flat panel display."
18. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

19. Claims 12 and 20-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the invention.

20. Claim 12 recites the limitation, "a high resolution area." However, the specification does not define this limitation. The Examiner is interpreting this limitation to mean many microprints in a small area.

21. Claims 20 and 25 recite the limitation "forming alignment marks on the peripheral area of the substrate." However, the specification does not describe this limitation in such a way as to enable one skilled in the art to which it pertains to form the alignment marks. It is known to those skilled in the art that alignment marks of this type are typically etched holes or grooves. However, the specification does not state if the alignment marks of this invention are formed by etching, or deposited using an ink-type or similar method. If the alignment marks are formed by etching, then the Examiner is unsure how locally applying a wet etch will remove them without permanently damaging the substrate.

22. Claims 21-24, and 26 depend from claims 20 and 25 respectfully, and are therefore also rejected.

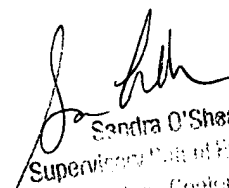
Claim Rejections - 35 USC § 102

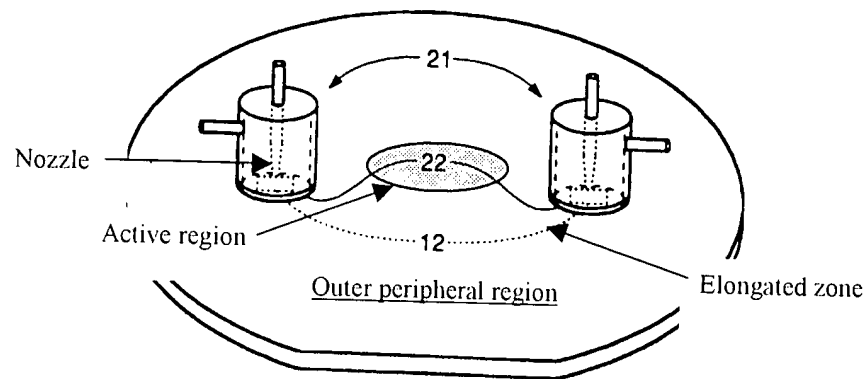
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

23. Claims 1, 3-8, 10-11, 27-30, are rejected under 35 U.S.C. 102(b) as being anticipated by Sandhu et al (USPN 5,271,798; "Sandhu").
24. In regards to claim 1, Sandhu discloses in figures 1-3 and in the abstract, a method for removing material (tungsten) covering a structure (silicon wafer), comprising locally applying an etchant on the material covering the structure. The Examiner notes that the claim is written in such a way that the preamble, which recites a flat panel display device, is afforded no patentable weight. See MPEP 2111.02.
25. In regards to claims 3-7, Sandhu discloses all of the recited limitations of claim 1 (above).
26. Sandhu further discloses that the structure comprises alignment marks (12), and the etchant comprises providing a localized spray of wet etchant over the structure (column 2 lines 66-68). Sandhu further discloses in figure 4 that applying an etchant comprises applying the etchant along an elongated zone (below) over a plurality of structures (11), and spraying a wet etchant from a nozzle (below) while moving the nozzle and the device relative to the other. Sandhu further discloses the device includes a central active region (below) and an outer region (below), wherein the structure is located in the outer region.


Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800



27. In regards to claim 8, Sandhu discloses in figures 1-3 and in the abstract, a method for removing a layer of material (tungsten) covering a structure (silicon wafer), comprising selectively directing an etchant on the layer of material covering the component located in the peripheral area without directing etchant toward the active display area. The Examiner notes that the claim is written in such a way that the preamble, which recites a flat panel display device, is afforded no patentable weight. See MPEP 2111.02.

28. In regards to claims 10-11 Sandhu discloses all of the recited limitations of claim 1 (above).

29. Sandhu further discloses that the structure comprises an alignment mark (12), and selectively directing an etchant comprises locally spraying etchant on the layer of material covering the component (column 2 lines 66-68).

30. In regards to claim 27, Sandhu discloses in figures 1-4 and the abstract, a process for removal of material (tungsten) covering a structure (silicon wafer), comprising selectively spraying a wet etchant in a localized fashion over the structure while limiting spraying on the central active region and thereafter rinsing residual etchant from the device. The Examiner notes that the claim is written in such a way that the preamble, which recites a flat panel display device, is afforded no patentable weight. See MPEP 2111.02.

31. In regards to claims 29-30, Sandhu discloses all of the recited limitations of claim 27 (above).

32. Sandhu further discloses that the structure comprises an alignment mark (12). Sandhu further discloses in figure 4 that spraying a wet etchant comprises spraying the etchant along an elongated zone (above) over a plurality of structures (11).

33. Claims 13, 16-17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Baldi et al (USPN 6,000,980; "Baldi").

34. In regards to claims 13 and 17, Baldi discloses in figures 4 and 12-15, and column 11 lines 17-37, a method of making a FED comprising making a cathode assembly (450) making an anode assembly (470), and assembling the cathode and anode assemblies, wherein the step of making a cathode and anode assemblies include a step of locally applying an etchant to uncover a structure (9) in a peripheral of the cathode assembly. The Examiner notes that although figure 12 shows the structure (9) is which is uncovered

is located in a central active, the claims are so broad that it can be interpreted that the structure is also located in a peripheral of the cathode assembly.

35. In regards to claim 16 and 19, Baldi discloses all of the recited limitations of claim 13 and 17 (above).

36. Baldi further discloses if column 11 lines 25-37, that the step of locally applying an etchant comprises spraying a wet etchant on the structure without spraying the etchant elsewhere.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

37. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

38. Claims 2, 9, 12, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu.
39. In regards to claims 2 and 9, Sandhu discloses all of the recited limitations of claims 1, 8, and 27 (above).
40. Sandhu is silent to the structure comprising a bond pad and the layer of material comprises a passivation layer, instead Sandhu discloses that tungsten residue is the desired etchant target.
41. However, on page 8 lines 15-16 of the instant specification, Applicant has recited that conventional FED fabrication uses metallic bond pads and passivation layers.
42. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct bond pads and passivation layers on an FED device, and using the process of Sandhu to etch them off, since Applicant has submitted that metallic bond pads and passivation layers in a step for manufacturing FED's are known in the art, and Sandhu discloses the tungsten residue is the desired etchant target.
43. In regards to claim 12, Sandhu discloses all of the recited limitations of claim 8 (above).
44. Sandhu is silent to the central active display area comprising a high resolution area.
45. However, FED's having a high-resolution area in a central active display area are well known in the art. These types of FED's are further known to have holes in a central region to let electrons pass through to an opposite phosphor panel. It would be obvious to those skilled in the art to use Sandhu's etching method to etch the holes in the central

active display area, since Sandhu discloses that this method reduces the number of photo steps (abstract) and therefore reduces manufacturing costs.

46. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of manufacturing of Sandhu, on an central active display area that has a high resolution area, since Sandhu discloses that this method reduces the number of photo steps and therefore reduces manufacturing costs.

47. In regards to claims 31 and 32, Sandhu discloses all of the recited limitations of claim 30 (above).

48. Sandhu further discloses that a nozzle (above) moves relative to the substrate while spraying the liquid etchant.

49. Sandhu is silent to a field emission display, but instead recites the etching process for a semiconductor wafer.

50. However, it is obvious to those skilled in the art that the etching process used in semiconductor manufacturing can be applied to field emission devices, and semiconductor manufactures had much experienced and success in etching alignment marks on different substrates. Further, Sandhu teaches in column 3 lines 46-52, that:

“...it will be apparent to one skilled in the art that changes and modifications, such as selectively etching any material in desired locations using a etchant dispensing apparatus, may be made thereto without departing from the spirit and scope of the invention as claimed.”

51. Therefore, at the time the invention was made, it would have been obvious to one having ordinary skill in the art of field emitters to look to Sandhu for a process of removing material covering a structure on a field emitter, since semiconductor

manufactures have had much experienced and success in etching alignment marks on different substrates.

52. Claims 14-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldi.

53. In regards to claim 14-15 and 18, Baldi discloses all of the recited limitations of claim 13 and 17 (above).

54. Baldi is silent the structure comprises an alignment mark or a bond pad.

55. However, the use of bond pads and alignment marks are well known in the art to aid the manufacturing of FED's.

56. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to manufacture the FED of Baldi, including an alignment mark and a bond pad, since these structures are well known in the art to aid the manufacturing of FED's.


Conclusion

57. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

58. U.S. Patents 4,513,308 to Greene et al; 5,064,396 to Spindt; and 6,554,671 to Hofmann et al all disclose methods of manufacturing a FED that has an active display area with a high resolution area and includes a wet etchant. However, they are not relied upon in this office action.

59. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (703) 305-7198. The examiner can normally be reached on 8 - 4:30, M-F.
60. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.
61. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

pjm
May 9, 2003


Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800